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| 09/780,717      | 02/09/2001  | Timothy G. Helentjaris | 35718/208677 (5718-126) | 6907             |

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EXAMINER

KALLIS, RUSSELL

ART UNIT

PAPER NUMBER

1638

DATE MAILED: 05/20/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/780,717

Applicant(s)

HELENTJARIS ET AL.

Examiner

Russell Kallis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-13 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) 23-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-13 and 16-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

Claims 1, 14 and 15 are cancelled. Claims 2-13 and 16-26 are pending.

#### *Election/Restrictions*

Newly submitted claims 23-26 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the invention originally claimed is drawn to SEQ ID NO: 1 from maize, while newly added Claims 23-26 are drawn to a yeast invertase inhibitor.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 23-26 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

The rejection of Claims 2-22 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention is withdrawn in view of Applicant's amendments.

The rejection of the Claims under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn in view of Applicant's amendments.

The rejection of Claims 2, 4, 8-11, 15, 16, 19 and 20-22 under 35 U.S.C. 102(b) as being anticipated by Bussis D. *et al.*, Planta 1997, 202:126-136 is withdrawn in view of Applicant's amendments.

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The rejection of Claims 2, 4, 8-11, 14, and 16-22 under 35 U.S.C. 102(b) as being anticipated by Greiner S. *et al.* Plant Physiology, 1998, Vol. 116, pp. 733-742 is withdrawn in view of Applicant's amendments.

The rejection of Claims 2, 4, 8-11, 14, and 16-22 under 35 U.S.C. 102(a) as being anticipated by Rausch T. *et al.*, WO 00/09719 A1 is withdrawn in view of Applicant's amendments.

The rejection of Claims 17-18 under 35 U.S.C. 103(a) as being unpatentable over Bussis *et al.* Planta 1997, 202:126-136 in view of Gordon-Kamm W. *et al.* The Plant Cell, July 1990, Vol. 2, pp. 603-618 is withdrawn in view of Applicant's amendments.

### ***Response to Arguments***

#### ***Claim Rejections - 35 USC § 112***

Claims 2-13 and 16-22 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant asserts that the cited references do not teach unpredictability. With respect to the Sander *et al.* reference, Applicant evokes common evolutionary origins as a speculative argument for a common mechanism and/or mode of action for invertase inhibitors (response page 11). This argument does not take into account that evolution often gives rise to divergence within isoforms resulting in specialization of function. The Sanders reference points out that there was a protective effect provided to the cell wall invertase but not the apoplastic invertase

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relative to the sucrose concentration within those cells, suggesting differential regulation of the two isoforms and that regulation by invertase inhibitor may be confined to specific isoforms.

Applicant asserts that the von Schaewen reference does not teach any effect on seed yield due to the inhibition of many other processes required for seed yield (response page 12). One of skill in the art would easily conclude that given the compromising of sucrose export and the significant reduction of photosynthesis, a reduction of seed yield in the tobacco plants taught by von Schaewen would be inevitable.

Applicant asserts, with respect to the Weber reference, that cotyledonous components other than starch and sugar are in substantially increased yield in the experiments. Applicant's arguments in support of increased seed yield are not supported by the Applicant's definition of seed yield on page 3 lines 27-28 as defined in the specification. Further, Applicant states that the present invention provides for the prevention of losses in yield on page 3 of the specification lines 29-31. The Weber reference clearly shows significant losses in sucrose and starch levels in the transgenic seeds and reductions in total embryo fresh weight in Table 1 and significant reduction in embryo dry weight in Table 2 when compared to wild type seeds. Furthermore, Applicant's specification provides no evidence to the contrary.

Applicant's assertions that the reference does not teach the unpredictability of modulating invertase activity or increasing seed yield in the manner set forth in Applicant's claimed invention, but merely shows a redistribution of carbohydrate partitioning (response page 12), is clearly mistaken as argued above.

Applicant asserts that the specification discloses a variety of routine methods and means for the positive modulation of invertase inhibitors (response pages 12-13). The mere disclosure

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in the specification of transformation methods and assays does not overcome the undue amount of trial and error experimentation needed to isolate a multitude of non-exemplified invertase sequences with at least 80% sequence identity to SEQ ID NO: 1, or a multitude of sequences which hybridize under low or moderate stringency thereto, and to evaluate their ability to either encode a protein with invertase inhibitor activity or to modulate invertase activity and/or to increase yield in transformed plants to possibly obtain success.

Claims 2-13 and 16-22 are deemed free of the prior art, given the failure of the prior art to teach or suggest an isolated polynucleotide of SEQ ID NO: 1 encoding a polypeptide of SEQ ID NO 2, the antisense polynucleotide sequence of SEQ ID NO: 1, plants transformed with said polynucleotides, and a method for increasing the yield in a plant expressing said polynucleotides.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kallis whose telephone number is (703) 305-5417. The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on (703) 306-3218. The fax phone numbers for the Group is (703) 308-4242 or (703) 305-3014.

Any inquiry of a general nature or relating to the status of this application or proceeding, or if the examiner cannot be reached as indicated above, should be directed to the receptionist, whose telephone number is (703) 308-0196.

Russell Kallis Ph.D.  
May 19, 2003

DAVID T. FOX  
PRIMARY EXAMINER  
GROUP 180-1638

